



OFGS File No. IR-2327 (3561)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of:

Michael Harke

Date: April 14, 2004

Serial No.: 10/645,296

Group Art Unit: 2834

Filed: August 21, 2003

Confirmation No.: 7194

For: POSITION ESTIMATION AND DEMAGNETIZATION DETECTION OF A
PERMANENT MAGNET MOTOR

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

SUBMISSION OF FORMAL DRAWINGS

Sir:

Enclosed please find 4 sheets of formal drawings containing Figs. 1 through 8 for the above-identified application to replace those originally filed. No new matter has been added. Entry is respectfully requested.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop Issue Fee, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 14, 2004:

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Enclosure

Respectfully submitted,

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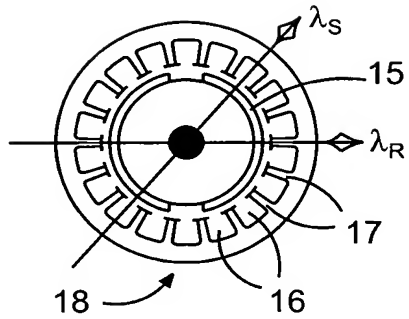
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The diagram illustrates a digital current control system for a motor. The system is divided into two domains: DIGITAL and CONTINUOUS, separated by a dashed vertical line.

- DIGITAL Domain:**
 - A reference current I_c is input to a block labeled $e^{j\theta_c}$.
 - The output of $e^{j\theta_c}$ is the reference current $i_{\alpha\beta}^*$, which is converted to a digital signal.
 - The digital reference current $i_{\alpha\beta}^*$ is converted back to a continuous signal and fed into the summing junction.
 - The digital feedback current $i_{\alpha\beta}$ is converted back to a continuous signal and fed into the summing junction.
 - The summing junction outputs the error signal $i_{\alpha\beta}^* - i_{\alpha\beta}$ to the Current Regulator (30).
 - The Current Regulator (30) outputs the reference voltage $V_{\alpha\beta}^*$ to the PWM VSI (20).
 - The PWM VSI (20) outputs the digital voltage signal $V_{\alpha\beta}^*$ to the A/D converter (22).
- CONTINUOUS Domain:**
 - The A/D converter (22) outputs the digital feedback current $i_{\alpha\beta}$ to the summing junction.
 - The PWM VSI (20) outputs the continuous voltage signal $V_{\alpha\beta}$ to the Motor (18).
 - The Motor (18) produces the continuous current $i_{\alpha\beta}$, which is fed back to the A/D converter (22).

FIG. 3

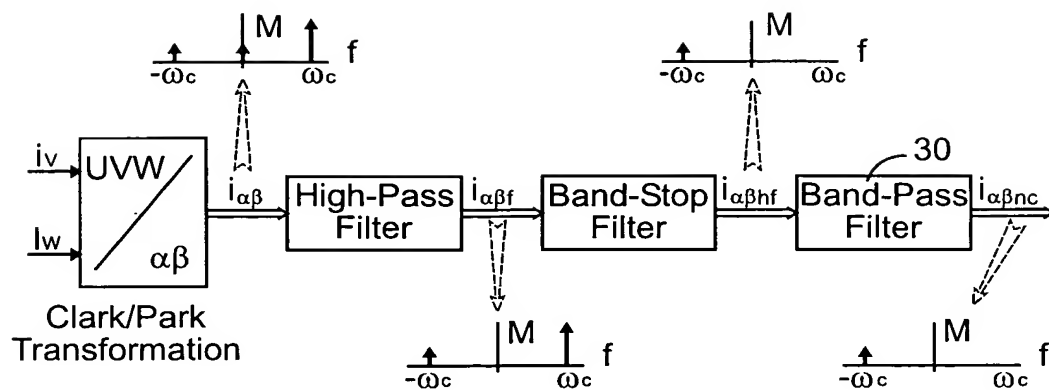


FIG. 4

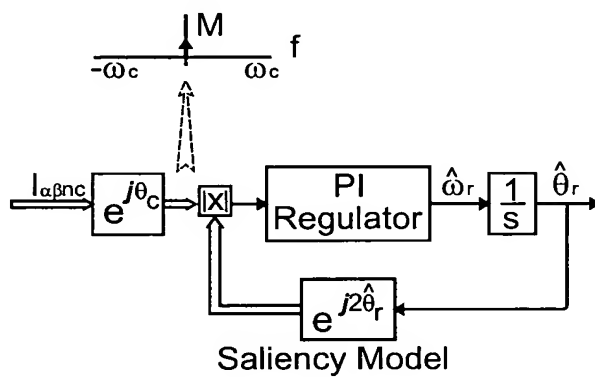


FIG. 5A

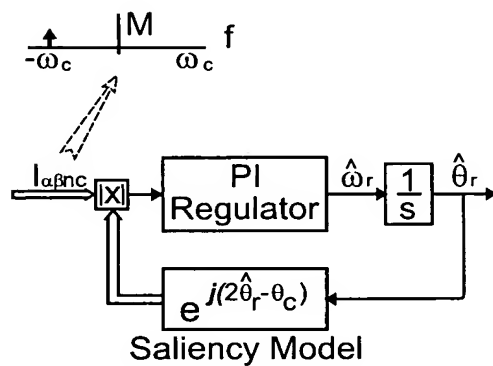


FIG. 5B

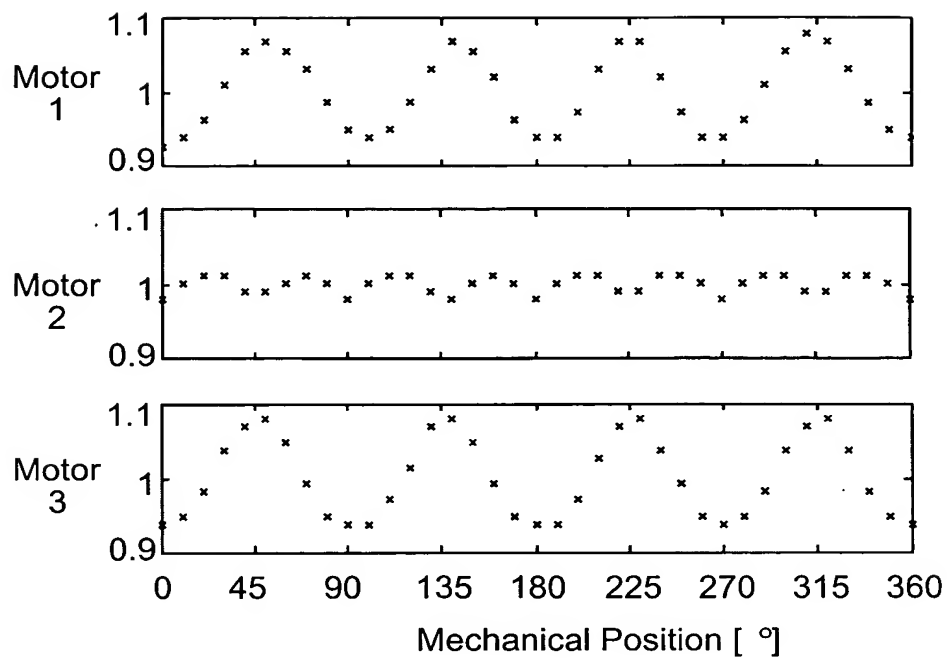


FIG. 6

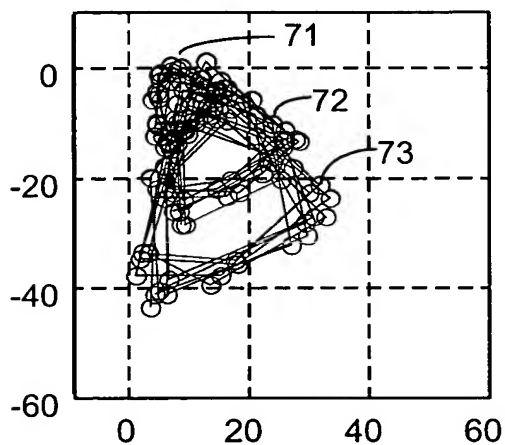


FIG. 7

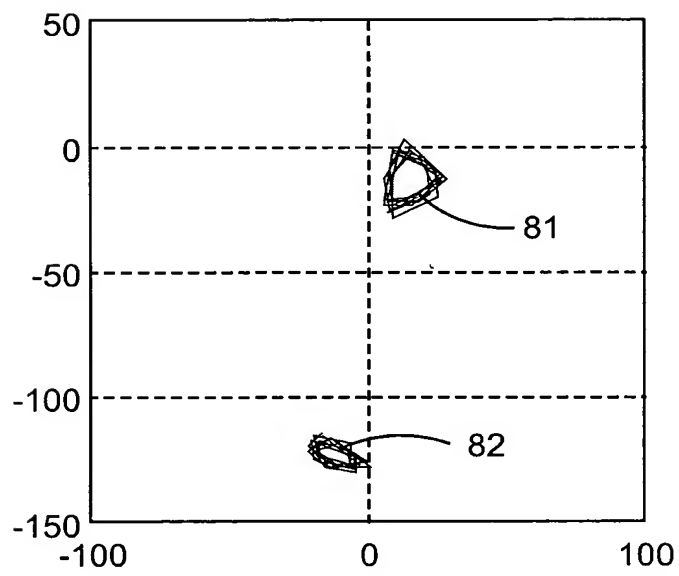


FIG. 8